

BERG, Lev G., Kazan State University

"Qualitative phase gas volumetric analysis"
(Section IV)

report to be submitted for the Second Conference on Clay Mineralogy and Petrography,
Prague, Czech., 10-17 May 1961.

BR

PHASE I BOOK EXPLOITATION

SOV/5917

Berg, Lev Germanovich

Vvedeniye v termografiyu (Introduction to Thermography) Moscow, Izd-vo AN SSSR, 1961. 367 p. Errata slip inserted. 3500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Kazanskiy filial. Khimicheskiy institut imeni A. Ye. Arbuzova.

Resp. Ed.: A. Ye. Arbuzov, Academician; Ed. of Publishing House: N. G. Yegorov; Tech. Ed.: G. A. Astaf'yeva.

PURPOSE: This book is intended for chemists, physicists, engineers, mineralogists, and other persons interested in the relationship of heat effects to the properties of substances.

COVERAGE: The book is a comprehensive treatise on thermographic analysis, the study of phase transformations of substances or systems of substances on the basis of thermal effects (including those which take place under pressure)

Card 1/4

Introduction to Thermography

SOV/5917

accompanying these transformations. The book contains photographs, drawings, and structural diagrams of thermographic equipment and thermograms of various substances, systems, and mixtures of substances. Tables of data on the nature of the thermal effects of various salts and minerals up to temperatures of 1260° C may be of special interest. The author thanks M. L. Blatt for preparing a number of the illustrations in this book. There are 1367 references, primarily Soviet.

TABLE OF CONTENTS [Abridged]:

Foreword	3
Introduction	5
Ch. I. The Essentials and Method of Thermography	8
Ch. II. Apparatus for Thermographic Research	22

Card 2/4

SAIBOVA, M.T.; BERG, L.G.

Thermographic phase analysis of some salt mixtures. Uzb. khim.
zhur. no.1:15-22 '61. (MIRA 14:1)

1. Institut khimii AN UzSSR i Khimicheskiy institut Kazanskogo
filiala AN SSSR.

(Salts)

BERG, L.G.; ANOSHINA, N.P.

Thermography and gas volumetry as a method of phase analysis of
building and binding materials. Izv.Kazan.fil. AN SSSR.
Ser.khim.nauk no.6:198-204 '61. (MIRA 16:5)
(Building materials) (Thermal analysis) (Titration)

BERG, L.G.; ANOSHINA, N.P.

Gas volumetric determination of boric acid. Izv.Kazan.fil.
AN SSSR. Ser.khim.nauk no.6:198-204 '61. (MIRA 16:5)
(Boric acid) (Titration)

BERG, L.G.; BORISOVA, L.A.

Metastable equilibria in the quinary reciprocal system Na^+ , Mg^{++} ,
 Ca^{++} // CO_3^{--} , SO_4^{--} - H_2O at 25° and $P_{\text{CO}_2} = 1$ atm. Izv.Kazan.fil.
Ser.khim.nauk no.6:210-217 '61. (MIRA 16:5)
(Systems (Chemistry)) (Solubility)

BERG, L.G.; BURMISTROVA, N.P.

Simultaneous recording of electric conductance on a thermogram as a method for determining the solidus line in salt systems. Izv.Kazan.-fil. AN SSSR. Ser.khim.nauk no.6:218-221 '61. (MIRA 16:5)
(Salts--Electric properties) (Phase rule and equilibrium)

BERG, L.G.; SIDOROVA, Ye.Ye.

Use of the thermographic method in the determination of molecular weights; report No.1. Izv.Kazan.fil. AN SSSR. Ser.khim.nauk no.6: 222-226 '61. (MIRA 16:5)

(Thermal analysis) (Molecular weights)

YAGFAROV, M.Sh.; BERG, L.G.

Straight-line heating. Izv.Kazan.fil. AN SSSR. Ser.khim.nauk no.6:
227-230 '61. (MIRA 16-6)

(Thermocouples) (Electric heating)

ACCESSION NR: AR4015649

S/0081/63/000/021/0028/0028

SOURCE: RZh. Khimiya, Abs. 218159

AUTHOR: Berg, L. G.; Yagfarov, M. Sh.; Gortalova, T. A.

TITLE: A study of the dependence of the thermal characteristics of some substances on temperature

CITED SOURCE: Izv. Kazansk. fil. AN SSSR. Ser. khim. n., no. 6, 1961, 231-237

TOPIC TAGS: temperature registration, thermographic temperature registration, thermal flux measurement, thermophysical characteristic measurement, temperature difference technique, heat capacity measurement, thermal conductivity measurement

ABSTRACT: The thermographic method for recording heating curves was used to determine heat capacity, the coefficient of thermal conductivity and temperature conductivity by measuring differences in thermal fluxes passing through the experimental substances and a standard control. The test unit containing both substances was heated in a quasi-stationary environment. Cylindrical, thin-walled, metallic shells were joined by means of a heat insulating material and were then placed inside a cylindrical block, in which a temperature field was created with a zero gradient on the exterior surface of the cylinder. The substance under investigation

Cord 1/2

ACCESSION NR: AR4015649

tion was placed inside one of these shells, the other serving as an air standard. The temperature field inside the block was measured with the aid of two differential thermocouples which recorded temperature differences between the shells as well as between the air standard and the block itself. The accuracy of measurement of the thermophysical characteristics was about 0.5% (verified for Al_2O_3 and KCl).
L. Reznitskiy

DATE ACQ: 09Dec63

SUB CODE: CH

ENCL: 00

Card 2/2

BERG, L.G.; BUZDOV, K.A.

Synthesis of ferrous carbonate and its thermal dissociation. Zhur.-
neorg.khim. 6 no.9:2003-2008 S '61. (MIRA 14:9)
(Iron carbonate) (Thermochemistry)

S/020/61/137/003/024/030
B101/B208

AUTHORS: Berg, L. G., and Borisova, L. A.

TITLE: Some relations in quantitative thermography

PERIODICAL: Doklady Akademii nauk SSSR, v. 137, no. 3, 1961, 631-633

TEXT: The authors discuss the comparability of the faces S measured on thermographic differential curves in substances with varying heat transfer coefficient K . K is defined as the sum of all factors that determine the heat transfer. It has been proved in Ref. 1 (L. G. Berf, Tr. 1 soveshch. po termografii, Izd. AN SSSR, 1955, str. 59 (Transactions of the First Conference on Thermography, Publishing House of the AS USSR, 1955, p. 59)) that such a comparison is possible if the faces are reduced to the same K value: $S'' = S' \Delta t'' / \Delta t'$ (I). $\Delta t'$, $\Delta t''$ are the temperature differences between substance and furnace. If K varies during the phase inversion, its mean value is measured, and Eq. (I) obtains the form: $S'' = S' (\Delta t''_1 + \Delta t''_2) / (\Delta t'_1 + \Delta t'_2)$ (II). The purpose of the present study was the experimental proof of the validity of Eq. (II). The faces

Card 1/

Some relations in quantitative ...

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B101/B208

were measured, which occur in the thermogram in the polymorphic conversion of KNO_3 . K was varied by adding substances with different heat conduction, with all other conditions including the heat capacity of the mixture being kept constant. The curves were recorded on an ЭПН-09 (EPP-09) recording potentiometer whose sensitivity was increased by reducing the resistance of the slide wire shunt from 235 to 4.5 ohms. Table 1 gives the experimental results. The curves of experiments 1, 3, 4, 5, and 8 are presented in Fig. 2. S was reduced to the face of curve 1. It was confirmed that the error of quantitative phase analysis is reduced, and the thermal effects of a thermogram with a maximum error of 3% may be rendered comparable by this reduction. There are 2 figures, 1 table, and 1 Soviet-bloc reference.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences USSR)

PRESENTED: October 29, 1960, by B. A. Arbuzov, Academician

SUBMITTED: October 15, 1960

Card 2/4

BERG, L.G.; SAIBOVA, M.T.

Physicochemical studies of some crystalline hydrates. Uzb.khim.
zhur. 6 no.5:54-60 '62. (MIRA 15:12)

1. Institut khimii AN UzSSR.
(Hydrates) (Thermal analysis)

BERG, L.G.; BUZDOV, K.A.

Determination of the thermal effects of the reaction of
 FeCO_3 dissociation. Zhur. neorg. khim. 7 no.8:1773-1778
Ag '62. (MIRA 16:6)

1. Kazanskiy gosudarstvennyy universitet imeni Ul'yanova-Lenina.
(Iron carbonate) (Thermal analysis)

BERG, L.G.; BUZDOV, K.A.

Solid solutions of iron (II) carbonates and manganese (II), iron (II), and magnesium. Zhur.neorg.khim. 7 no.9:2207-2212 S '62.
(MIRA 15:9)

1. Kazanskiy gosudarstvennyy universitet imeni Ul'yanova-Lenina.
(Solutions, Solid)

BERG, L.G.; PRIBYLOV, K.P.

Gas volumetric investigations at reduced pressures. Zav.lab. 28
no.7:828-830 '62 (MIRA 15:6)

1. Kazanskiy gosudarstvennyy universitet im. V.I.Ul'yanova-Lenina.
(Volumetric apparatus)

BERG, L.G.; KOVYZINA, V.P.

Thermodynamics of dissociation of ferrous and manganous hydroxides.
Zhur.neorg.khim. 8 no.9:2041-2045 S '63. (MIRA 16:10)

BERG, L.G.; KOVIRZINA, V.P.

Effect of admixtures on the dissociation of cadmium carbonate.
Dokl. AN SSSR 151 no.1:117-119 J1 '63. (MIRA 16:9)

1. Khimicheskiy institut im. A.Ye. Arbuzova AN SSSR, Kazan'.
Predstavleno akademikom A.Ye. Arbuzovym.
(Cadmium carbonate) (Dissociation)

BERG, L.G.; SIDOROVA, Ye.Ye.; VLASOV, V.V.; SOZIN, Yu.I.;
AVVAKUMOVA, K.N.

Cadmium nitrate tetrahydrate and the products of its dehy-
dration. Zhur. neorg. khim. 9 no.3:538-546 Mr '64.

(MIRA 17:3)

1. Khimicheskiy institut AN SSSR i Kazanskiy filial AN SSSR.

BERG, L.G.; PRIBYLOV, K.F.

Gas-volumetric investigation of the process of thermal dehydration of epsomite at lowered pressures. Zhur. neorg. khim. 9 no.6:1514-1516 36 '63 (MIRA 17:8)

1. Kazanskiy gosudarstvennyy universitet.

BERG, L.G.; KOVYZINA, A.P.

Article by A. Reisman "Remarks on the differential thermal analysis
of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ [1]" reviewed by L.G. Berg, A.P. Kovyzina. Zhur. neorg.
khim. 8 no.12:2842 D '63. (MIRA 17:9)

BENG, L.G.; PRIBYLOV, K.P.

Thermal dehydration of $ZnSO_4 \cdot 7H_2O$ at low pressures. Izv. vys. ucheb. zav.; khim. i khim. tekh. 7 no.4:535-539 '64.

(PURA 17:12)

1. Kazanskiy gosudarstvennyy universitet imeni V.I. Ul'yanova-lenina, kafedra neorganicheskoy khimii.

BERG, L.G.; REMIZNIKOVA, V.I.; VLASOV, V.V.

Chemism of the interaction between kaolinite and sodium hydroxide.
Izv.vyslucheb.zav.; khim. i khim.tekh. 8 no.2:181-185 '65.

(MIRA 18:8)

1. Kazanskiy gosudarstvennyy universitet imeni Ul'yanova-Lenina,
kafedra neorganicheskoy khimii.

BERG, L.G.; PRIBYLOV, K.P.

Determination of the thermal effects of $MgSO_4 \cdot 7H_2O$ dehydration.
Zhur. neorg. khim. 10 no.6:1419-1422 Ja '65.

(MIRA 18:6)

1. Kazanskiy gosudarstvennyy universitet.

L 42878-66 EWT(m)/I/EWP(t)/ETI IJP(c) JD/WW/JW/JWD

ACC NR: AP6022894

SOURCE CODE: UR/0078/66/011/004/0886/0889

AUTHOR: Berg, L. G.; Yasnikova, T. Ye.

ORG: Kazan State University im. V. I. Ul'yanov-Lenin (Kazanskiy gosudarstvennyy universitet)

TITLE: Thermographic determination of the heats of polymorphic transformations

SOURCE: Zhurnal neorganicheskoy khimii, v. 11, no. 4, 1966, 886-889

TOPIC TAGS: phase transition, heat of transition, thermogram

ABSTRACT: An experimental study was made to determine the heats of polymorphic transformations recorded on various thermograms. The calculation was carried out by using the formula

$$\frac{Q_1}{Q_2} = x \frac{S_1}{S_2}$$

where Q_1 and Q_2 are the heats of the phase transformations, S_1 and S_2 are the reduced areas of differential peaks, and x is a conversion factor. The chosen substance with a known heat of polymorphic transformation was KNO_3 . The substances studied were NH_4Br , NH_4Cl , $AgNO_3$, and NH_4NO_3 (which had three different heats of transformation), and the corresponding six values, determined directly from the thermograms, were found

Card 1/2

UDC: 536.65:541.7

L 42878-66

ACC NR: AP6022894

to be in good agreement with data reported in the literature. Orig. art. has: 2 figures, 1 table, and 4 formulas.

SUB CODE: 07,20/SUBM DATE: 16Jan65/ ORIG REF: 005/ OTH REF: 005

Card 2/2

ACC NR: AP7006231

(A)

SOURCE CODE: UR/0078/67/012/001/0213/0215

AUTHOR: Berg, L. G.; Malkova, T. I.; Pavlova, A. K.

ORG: none

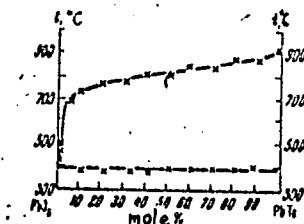
TITLE: The PbTe-PbI₂ system

SOURCE: Zhurnal neorganicheskoy khimii, v. 12, no. 1, 1967, 213-215

TOPIC TAGS: lead alloy, tellurium alloy, iodide, lead compound

ABSTRACT: The PbTe-PbI₂ section in the ternary system Pb-Te-I₂ was studied by differential thermal analysis. The thermograms showed two distinct and characteristic endothermic effects. The first effect is at 380-385°C; the temperature of the second effect drops from 917°C (melting point of pure PbTe) to 425°C at 0.5 mole % PbTe and 99.5 mole % PbI₂. A phase diagram of the PbTe-PbI₂ system (Fig. 1) was plotted from

Fig. 1. Phase diagram of the PbTe-PbI₂ system



Card 1/2

UDC: 541.123.2

ACC NR: AP7006231

these thermographic data. It is a diagram with a degenerate eutectic. In order to detect traces of a liquid phase in the system during heating of the alloys, a thermogram was recorded with simultaneous recording of the electric conductivity. The results of differential thermal analysis were checked by x-ray phase analysis, which confirmed the presence of only two phases, PbTe and PbI₂. Measurement of the thermal emf showed that all the alloys in the system were of n type, except pure PbTe, which had a p-type conductivity. Hence, a gradual addition of PbI₂ to PbTe causes a change in the conductivity sign (which occurs at 3% PbI₂ + 97% PbTe). Orig. art. has: 5 figures.

SUB CODE: 07,20/ SUBM DATE: 27Mar65/ ORIG REF: 004/ OTH REF: 001

Card 2/2

DECEASED

BERG, Lev Semenovich, akademik; NIKOL'SKIY, G.V., otv. red.; OBRUCHEV, D.V., doktor ~~biol. nauk~~, otv. red.; GELLEN, S.Yu., red.; GERASIMOV, I.P., akademik, red.; GRIGOR'YEV, A.A., akademik, red.; KALESNIK, S.V., red.; LINDBERG, G.U., red.; MARKOV, K.K., red.; MURZAYEV, E.M., red.; NIKOL'SKAYA, V.V., red.; PAVLOVSKIY, Ye.N., akademik, red.; SVETOVIDOV, A.N., red.; SABLINA, T.B., red. izd-va; YEGOROVA, N.F., tekhn. red.

[Selected works] Izbrannye trudy. Moskva, Izd-vo Akad. nauk SSSR. Vol.5. [General biology, biogeography, and paleoichthyology] Obshchaya biologiya, biogeografiya i paleo-ikhtiologiya. 1962. 513 p. (MIRA 15:10)

1. Chlen-korrespondent Akademii nauk SSSR (for Kalesnik, Nikol'skiy Svetovidov).
(Biology) (Geographical distribution of animal and plants)
(Fishes, Fossil)

BERG, L.S. [deceased]

Recurring ethnographical subjects. Izv. Kir. fil. Geog. ob-va
SSSR no.4:9-14 '63. (MIRA 16:12)

MAKAROV, F.N., red.; BERG, L.V., st. nauchn. sotr., red.

[Materials of the Scientific Technological Conference on the Problems in the Establishment of Machinery for Mountain Lumbering Camps and in the Increase of Labor Productivity] Materialy Nauchno-tekhnicheskoi konferentsii po voprosam sozdaniia tekhniki gor' n lesoragotovki i povysheniia proizvoditel'nosti truda. Krasnodar, Izd-vo "Sovetskaiia Kuban'," 1963. 103 p. (BIBL 17:10)

1. Nauchno-tekhnicheskaya konferentsiya po voprosam sozdaniia tekhniki gornykh lesoragotovok i povysheniia proizvoditel'nosti truda, 1960. 2. Nachal'nik laboratorii Kavkazskogo filiala Tsentral'nogo nauchno-issledovatel'skogo instituta mekhanizatsii i energetiki lesnoy promyshlennosti (for Makarov). 3. Kavkazskiy filial Tsentral'nogo nauchno-issledovatel'skogo instituta mekhanizatsii i energetiki lesnoy promyshlennosti (for Berg).

BERG, M.

Revise regulations for writing off automobiles as beyond repair.
Avt.transp. 32 no.6:34 Je '54. (MLRA 7:9)
(Automobiles)

BERG, M.

Revising truck braking-distance tables. Avt.transp.33 no.1:
35 Ja'55. (MLRA 8:3)
(Automobiles---Brakes)

DMITRIYEV, V., starshiy inzh.; BERG, M., starshiy inzh.

Seagoing passenger liner with accomodations for 750 people.
Mor.flot 22 no.1:31-32 Ja '62. (MIRA 15:1)

1. Gosudarstvennyy proyektno-konstruktorskiy i nauchno-issledovatel'skiy institut morskogo transporta.
(Merchant ships--Passenger accomodations)

PASTUKHOV, A.; BERG, M.

The dry-cargo motorship "Murom." Mor. flot. 24 no.11:40
N '64. (MIRA 18:8)

1. Glavnyy spetsialist Gosudarstvennogo proyektno-konstruktor-
skogo i nauchno-issledovatel'skogo instituta morskogo transporta
(for Pastukhov). 2. Vedushchiy konstruktor Gosudarstvennogo
proyektno-konstruktorskogo i nauchno-issledovatel'skogo instituta
morskogo transporta (for Berg).

GARNER, L.; BERG, M.A. [translator]; SHAMSHUR, V.I., redaktor; VORONIN, K.P.,
tekhnicheskiiy redaktor

[Transistors and their application. Translated from the English]
Poluprovodnikovye triody i ikh primeneniye. Perevod s angliiskogo
M.A.Berg. Moskva, Gos. energ. izd-vo, 1956. 55 p. (Massovaya radio-
biblioteka, no.254) (MLRA 10:2)
(Transistors)

12 К 6, М. А.

О. Е. Петрушин

Переходный процесс в полупроводниковых диодах при протекании тока и в режиме выпрямления при малых токах малой длительности.

М. С. Воронин

Приближенный метод расчета переходных процессов в полупроводниковых транзисторах при больших сигналах.

М. И. Зарин

Исследование работы элементов полупроводниковых транзисторов в режиме генератора высокочастотных сигналов при больших уровнях сигнала.

М. А. Вайс

Определение чувствительности к перекрестным полупроводниковым приборам.

С. А. Горюнов

Полупроводниковые приборы с отрицательными сопротивлениями в их структуре и их применение в радиотехнических схемах.

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Совместное заседание с секцией радиотехнических устройств.

14

В. И. Георгиев

Дифференциальный транзистор на полупроводниковых приборах.

А. Ю. Горюнов

Е. В. Гальперин

Е. И. Зарин

Г. В. Катков

В. А. Калитин

Специальные элементы цифровой вычислительной машины на полупроводниковых приборах.

М. И. Петрушин

Т. И. Алексеев

М. С. Воронин

В. А. Горюнов

В. И. Катков

В. И. Лебедев

А. Г. Буланов

Ю. И. Филт

Комплекс полупроводниковых элементов в радиотехнической вычислительной машине.

В. И. Катков

Фронт выделенный импульсом в транзисторном элементе с обратной связью с учетом индуктивности емкости коллектора.

15

report submitted for the Confidential Meeting of the Scientific Technological Society of Radio Engineering and Electrical Communications in A. S. Popov (VSEI), Moscow, 8-12 June, 1959

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SOV/109-5-2-16/26

AUTHORS: Berg, M. A., Garyainov, S. A.

TITLE: Semiconductor Two-Terminal Device With Negative Resistance

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 2, pp 301-309 (USSR)

ABSTRACT: A number of papers published in the last few years deal with problems of multielectrode devices with negative resistance, based on an avalanche-type multiplication of charge carriers in a p-n junction, to which a reverse voltage is applied. Since these devices are very valuable in oscillatory, amplifying, changeover, and computer circuits, it is of interest to investigate simple two-terminal devices having a section of negative resistance in their volt-ampere characteristics. The simplest method of constructing such a device is proposed by A. Reaves, R. W. Cooke (L'onde Electrique, 1954, 322, 1), describing a point contact germanium

Card 1/16

Semiconductor Two-Terminal Device
With Negative Resistance

77783
SOV/109-5-2-16/26

diode with a negative resistance on the forward branch of the volt-ampere characteristic. They used a silver wire with a small donor admixture. The negative resistance appeared after an electric forming with strong currents. The authors reproduced a similar device and discovered a negative resistance on both the forward and return branch of the volt-ampere characteristic, the more stable portion being on the return branch. It is probable that an n-p-n structure developed under the contact. Flat and asymmetrical two-electrode systems of n-p-n and p-n-p types were investigated by U.S. scientists S. L. Miller and J. Ebers (see U.S. refs). There were, however, no comprehensive analyses made of phenomena leading to the development of negative resistance. The authors experimented with two-electrode devices of the p-n-p type constructed by melting indium into electronic germanium. The results of those experiments are given in this paper. The possible mechanics of achieving negative resistance are discussed. approximated analytical expressions of the volt-ampere characteristic are developed, and some data on the

Card 2/16

Semiconductor Two-Terminal Device
With Negative Resistance

77733
SOV/100-5-2-14/26

performance of these devices in radiotechnical circuits are given. (1) Possible physical processes leading to establishing of a negative resistance in two-electrode semiconductor devices. The mathematical expression for negative resistance in two-electrode semiconductor devices is:

$$R^{(-)} = \frac{-\partial U}{\partial I} \approx \frac{-\Delta U}{\Delta I}. \quad (1)$$

where the minus sign before ΔU indicates an increase of conductivity of the device with increase of the current, and a considerable increase of the number of current carriers in the p-n junctions due to impact ionization is possible only if combined with a regenerative process stimulated by a positive feedback in the device. Thus, two conductivity raising sources are required, working together in such a way that the increase of conductivity by one causes a corresponding increase by the other. As the second source can be used: (1) thermal generation of charge carriers as used in

Card 3/16

Semiconductor Two-Terminal Device
With Negative Resistance

77783
SOV/109-5-2-16/26

DGTse4 to DGTse12 point contact germanium diodes; these devices have a strong inertial nonlinearity, and parameters strongly dependent on temperature, thus rendering them useless in the high-frequency range; (2) a second p-n junction, with an injection of current carriers increasing with the current increase, the device using the effect of light, the Siener effect, the shift current of the external source imperfectness of the p-n junction at which the reverse voltage is applied. These conditions can be established in the semiconductor structure as shown on Fig. 1. The initial current increase in such a system is achieved by the use of multiplication at the polarity shown in Fig. 1, the junction Π_1 (further called emitter) is shifted forward, while the junction Π_2 (further called collector) is shifted in the reverse direction. At a voltage lower than the critical U_{cr} , at which impact ionization begins, a current of the order of the collector saturation flows through the p-n-p structure.

Card 4/16

Semiconductor Two-Terminal Device
With Negative Resistance

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SOV/109-5-2-16/26

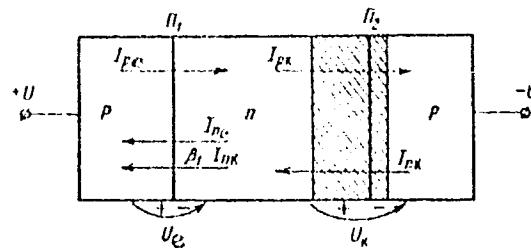


Fig. 1. p-n-p Type structure.

Electrons entering from the collector charge the base negatively, lowering its potential, thus increasing the hole current through the emitter. The ratio of the increase of the full current to the increase of the electron current at the collector junction equals:

Card 5/16

$$\frac{\partial I}{\partial I_{EK}} = \alpha_0 \approx \frac{1 - \alpha_0 \beta_1}{1 - \alpha_0} \quad (3)$$

Semiconductor Two-Terminal Device
With Negative Resistance

77783

SOV/109-5-2-16/26

where $\alpha_o = \gamma \beta_2$; $\beta_2 = \frac{\partial I_{pk}}{\partial I_{pe}}$ is transmission coefficient of holes from the emitter to the collector; $\gamma = \frac{I_{pe}}{I_{pe} + I_{ne}}$ is emitter effectiveness;

β_1 is coefficient of electron transmission from collector to emitter (here, $\alpha_o < 1$ and $\beta_1 < 1$ and, therefore, $\alpha_e^* > 1$); I_{pe} , I_{ne} , I_{pk} , I_{nk} are hole and electron components of emitter and collector currents. The avalanchelike increase of current may lead to a flooding of the collector junction, which causes there a lowering of potential, and subsequent appearance of a negative resistance section of the volt-ampere characteristic. (2)
Development of an expression for the volt-ampere characteristic of the p-n-p structure in a two-terminal device. Ignoring the part of the electron current reaching the collector junction, in comparison with

Card 6 /16

Semiconductor Two-Terminal Device
With Negative Resistance

77783
SOV/109-5-2-16/26

other currents the following two equations are written:

$$I_p = I_{pe} + I_{ne} + M_n \beta_1 I_{nn} \quad (4)$$

$$I_k = M_p I_{pm} + M_n I_{nn} \quad (5)$$

where M_n is electron multiplication coefficient; M_p , hole multiplication coefficient. Coefficient β_1 is determined from the equality of the recombination currents of holes and electrons in the base:

$$(1 - \beta_2) I_{pe} = (1 - \beta_1) I_{nn}$$

Considering that $I = I_e = I_k$ from (4) and (5) follows:

$$I = \frac{I_{nn} M_n (1 - \alpha_0 M_p) + \alpha_0 M_p (1 - \beta_2) I_{pe}}{1 - \alpha_0 M_p} \quad (6)$$

The currents in Eq. (6) may be found by solving the equations of continuity and diffusions, and after substituting these values (6) can be transformed into (7), where the currents are expressed with reference to a unity area of the junction:

Card 7/16

Semiconductor Two-Terminal Device
With Negative Resistance

77783
SOV/109-5-2-16/26

$$J = \frac{1}{1 - \alpha_0 M(U)} \frac{1 - e^{aU}}{e^{aU} - k} \{ \alpha_0 M(U) J_{ps} D (k+1) - M(U) [1 - \alpha_0 M(U)] J_{ns} \}, \quad (7)$$

where J_{ps} , J_{ns} are hole and electronic components of the saturation current.

$$a = \frac{q}{kT}; \quad k = \frac{J_{ps} \text{ch} \frac{l}{L_p} (1 - \alpha_0 M)}{J_{ns} + J_{ps} \frac{1}{\text{sh} \frac{l}{L_p}} (1 - \alpha_0 M)}; \quad D = \frac{\text{ch} \frac{l}{L_p} - 1}{\text{sh} \frac{l}{L_p}};$$

l is base width; L_p , diffusion length of holes. It is assumed that $U = U_c + U_k$, $M = M_p = M_n$. This equation is valid only for the beginning of the section of negative resistance, but it permits evaluation of the further behaviour of the p-n-p structure. Equation (7) shows that the shape of the volt-ampere characteristic is basically determined by the term $1/1 - \alpha_0 M$.

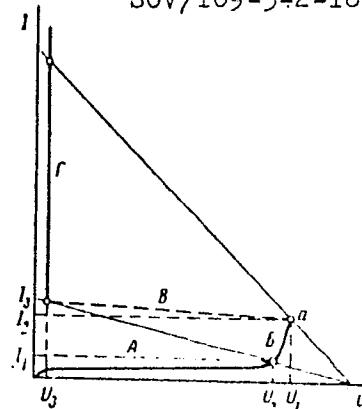
Card 8 /16

Figure 2 shows an idealized volt-ampere characteristic.

Semiconductor Two-Terminal Device
With Negative Resistance

77783
SOV/109-5-2-16/26

Fig. 2. Idealized
volt-ampere charac-
teristic of a p-n-p
type structure.



For $U \ll U_B$ (where U_B = breakdown voltage) when $M = 1$,
the product $\alpha_o M < 1$, and the current flowing
through the structure is of the order of the
collector saturation current (area A on Fig. 2).

Card 916

For $U \rightarrow U_B$, $\alpha_o M \rightarrow 1$, and the current tends to

Semiconductor Two-Terminal Device
With Negative Resistance

77783
SOV/109-5-2-16/26

become infinitely large and is limited only by the external resistance R (area B on Fig. 2); the current is $I = (E - U_2)R^{-1}$. With further voltage increase

$\alpha_o M = 1$, and the collector is flooded; and at point a of Fig. 2 the transition to a low-resistance stage occurs at:

$$U_1 = U_0 / (1 - \alpha_o), \quad (8)$$

which can be determined from condition $\alpha_o M = 1$.

Area C is unstable ($M = 1$, $\alpha_o = 1$). For area D

$M = 1$, $\alpha_o \approx 1$, and the current is independent of

the voltage, being determined by the external resistance. (3) Experiment. For the experiments germanium plates with indium and admixtures melted into the plates in a hydrogen atmosphere were used in the p-n-p structures; the resistivity of the plate was 0.8-0.5 ohm/cm.

Card 10/16

Semiconductor Two-Terminal Device
With Negative Resistance

77783

SOV/109-5-2-16/26

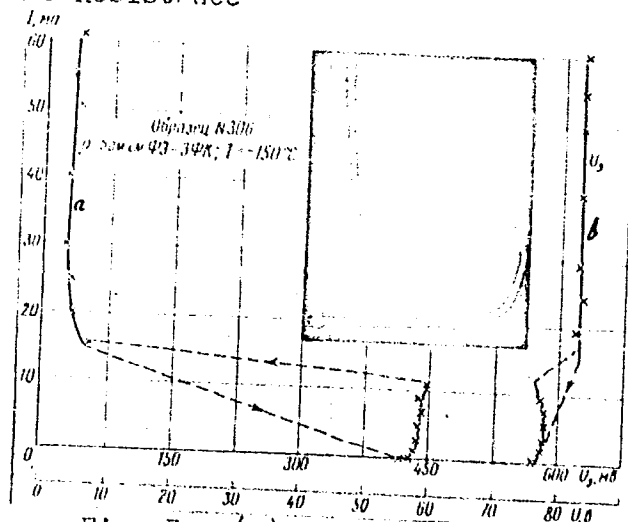


Fig. 3. (a) Experimental characteristic of p-n-p structure and its oscillogram; (b) relation of emitter voltage to current.

Card 11/16

Semiconductor Two-Terminal Device
With Negative Resistance

77783
SOV/109-5-2-16/26

The characteristic measurements were made at low temperatures. Curve b on Fig. 3 illustrates the relation of emitter voltage to current, showing a coincidence of jumping voltage changes on the collector and emitter. The theoretical results for U_1 from (8) agree with experimental data within the investigated range of ρ . Figure 4 shows the calculation diagram for the relation of transfer voltage U_1 to ρ . Figure 5 shows experimental graphs for the relation of $\frac{U_1}{U_B}$ and α_0 to resistivity ρ . Experiments proved a very pronounced dependence of α_0 on the current when the emitter area was 2-3 times as large as the collector area, which was of the order of 0.01 cm^2 . Illumination of the collector decreases U_1 . The time of transition to the state of low resistance was 0.1 to 0.35 μsec .

Card 12/16

Semiconductor Two-Terminal Device
With Negative Resistance

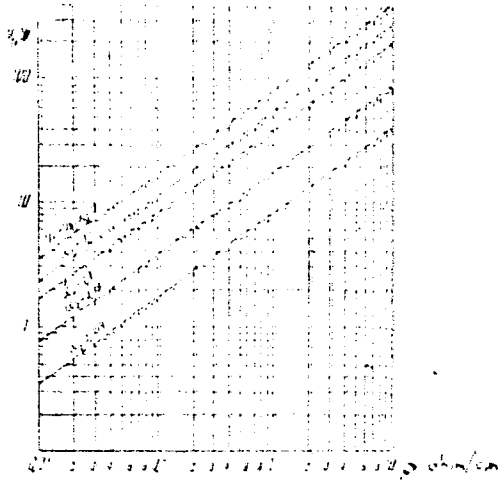


Fig. 4. Relation of transfer voltage U_1 to ρ for various values of α_0 per Eq. (6).

11/15
801/100-0-1 16/10

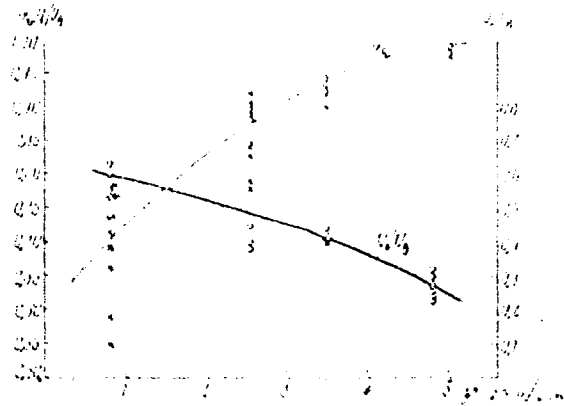


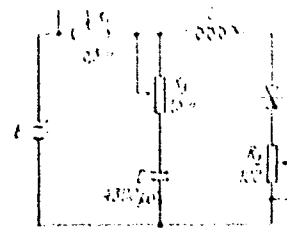
Fig. 5. Relation of relative voltage U_1/α_0 and values of α_0 to ρ .
June 13/16

Semiconductor Two-Terminal Device
With Negative Resistance

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SOV/100-5-2-16/16

(4) Application of the device. The active non-linearity of the volt-ampere characteristic makes the two-terminal device useful in many changeover and generator circuits.

Fig. 8. Oscillator circuit with a negative resistance device.



This circuit generates saw-tooth oscillation at $R_2 = 0$. Resistance changes the oscillation frequency without change of the time constant of the capacitive charging circuit. The low inductivity L is used to improve the linearity of the output voltage. Oscillograms did show that the nonlinearity of the saw tooth does not exceed 1% for a low inductance.

Card 14/16

Semiconductor Two-Terminal Device
With Negative Resistance

77783
SOV/109-5-2-16/26

Maximum frequency obtained was 1,750 kc. Exclusion of R_2 and R_3 and selection of the working point in the middle of the negative resistance section gives a sinusoidal wave oscillator. A circuit with one equilibrium state is achieved by a selection of a proper R_1 and source voltage E resulting in location of the working point in the D area of the volt-ampere characteristic, and introducing, after elimination of R_2 , positive trigger pulses into the created gap. The minimum amplitude of the trigger pulses is 1-5 v. A circuit with two equilibrium states can be constructed eliminating R_3 , C , and L , and supplying trigger pulses of different polarity through a small capacitor. R_1 and E must be so selected that the straight load line crosses the volt-ampere characteristic in three points. These two-terminal devices can be used with advantage in schemes where point contact devices are usually used. B. M. Vul.

Card 15/16

Semiconductor Two-Terminal Device
With Negative Resistance

11/83
SOV/109-5-2-16/26

N. A. Pepin, and N. A. Belova helped. There are 10 figures; and 15 references, 7 Soviet, 7 U.S., 1 French. The 5 most recent U.S. references are: J. L. Moll et al., Proc. I. R. E. 1956, 44, 9, 1174; W. Shockley, Tele-Tech., 1957, 76, 8, 58; I. M. MacIntosh, Proc. I. R. E., 1958, 46, 6, 1229; W. Read, Bell Systems Techn. J., 1958, 37, 2, 401; S. L. Miller, Phys. Rev., 1955, 99, 4, 1234.

PRESENTED: At the 2nd Scientific Technical Conference for application of transistors in the construction of devices, October 1958, in Moscow, USSR

SUBMITTED: May 30, 1959

Card 16/16

24075

S/106/61/000/002/004/006
A055/A133

9,4300

AUTHORS: Berg, M. A. and Garyainov, S. A.

TITLE: Semiconductor devices with negative resistance

PERIODICAL: Elektrosvyaz', no. 2, 1961, 31 - 41

TEXT: After a few words on the practical application of semiconductor-devices with negative resistance, and some general information on the breakdown of semiconductors into several groups or classes and on their respective characteristics, the authors proceed to a comprehensive analysis of the process resulting in the appearance of a negative-resistance portion in the current-voltage characteristic of: 1) a p-n-p type three-electrode device having a current-voltage characteristic of the second class, and 2) a tunnel-type diode having a current-voltage characteristic of the first class. In their analysis the authors emphasize the fact that the existence of at least two sources of conductivity variation is typical for any negative-resistance device. In the second part of their article, the authors compare the current-voltage characteristics of the first and second classes, and state the observed differences. This comparative analysis shows that negative-resistance semiconductor-devices having either a first-class

Card 1/3

24075

S/106/61/000/002/004/006

A055/A133

Semiconductor devices with negative resistance

or a second-class current-voltage characteristic can be used as amplifiers. An appropriate choice of the load and of the position of the quiescent point within the negative-resistance portion allows to prevent self-excitation in the absence of any signal. Considering the optimum operating value of the negative resistance, the authors state that this value is obtained when maximum negative power is released by the semiconductor-device in the negative-resistance portion of the characteristic. The feature characterizing any negative-resistance device is indeed, not the value of the negative resistance $r(-)$, but the negative power released in the negative-resistance portion of the current-voltage characteristic. This power must be as great as possible in any design containing negative resistances. Both classes of negative-resistance semiconductor-devices (i.e. either with first-class or second-class current-voltage characteristic) can be used in oscillating circuits as well as in amplifier circuits. The particular conditions of their use in switching circuits are discussed in the last part of the article. There are 15 figures and 14 references: 6 Soviet-bloc and 8 non-Soviet-bloc. The references to the four most recent English-language publications read as follows: Shockley, "Unique properties of the 4-layer diode". Electronic Industries & Tele-Tech, 76, no. 8, 1957. Philips, Chang. "Germanium power switching devices." IRE Transactions on Electron devices. ED-5, no. 1, 1958; Read. "A proposed high frequency

Card 2/3

Semiconductor devices with negative resistance

24075
S/106/61/000/002/004/006
A055/A133

negative resistance diode." BSTJ, XXXVII, no. 2, 1958; Sommers. "Tunnel diodes
as high frequency devices." Proc. IRE, 47, no. 7, 1959

SUBMITTED: April 27, 1960.

Card 3/3

BERG, M.A.; GARYAINOV, S.A.

Experimental study of the switching operation in two-electrode
p-n-p-n transistor devices with negative resistance. Radiotekhnika
17 no.1:51-58 Ja '62. (MIRA 15:2)

1. Deystvitel'nyye chleny Nauchno-tekhnicheskogo obshchestva
radiotekhniki i elektrosvyazi imeni Popova.
(Transistors)

ACCESSION NR: AT4034378

S/2662/63/000/010/0019/0023

AUTHOR: Derg, M. A.; Shofov, N. N.

TITLE: Hydroxyl emission with varying vibrational excitation

SOURCE: AN SSSR. Mezhdunarodnyy geofizicheskiy komitet. IV razdel
programmy* MGG: Polyarnyye svyazi i svecheniye nochnogo neba. Sbornik statey,
no. 10, 1963, 19-23

TOPIC TAGS: meteorology, geophysics, aurora, nightglow, hydroxyl emission, at-
mospheric emission, rotational temperature, oxygen emission

ABSTRACT: The authors point out that preliminary processing of derived spectra
has led to the discovery that the rotational temperatures for OH bands from vibra-
tional levels above the sixth are systematically greater than for levels below the
fifth, with these differences being particularly evident in the case of high ro-
tational temperatures. On the basis of this fact, the conclusion is drawn that the
emission of OH bands from upper and lower vibrational levels evidently occurs at
different heights. Complete processing of the available material has completely
supported the former results and brought to light a number of new peculiarities.
The authors have, for example, found that there is apparently a closer relation be-
tween rotational temperatures of bands from levels beneath the fifth as well as for

Card 1/6

3

ACCESSION NR: AT4034378

bands from levels above the sixth. Meanwhile, the relation between the rotational temperatures from the higher and lower vibrational levels is less clearly expressed. On the average, the temperature of bands from the fourth level is higher than for the fifth, for the third - higher than for the fourth. The temperature for bands from the sixth level is higher than for the fifth and from the seventh higher than for the sixth. The difference in rotational temperatures for adjacent vibrational levels is, on the average, on the order of ten degrees. The result of a comparison of the intensities of different bands was very close to that obtained from the comparison of rotational temperatures. In the authors' opinion, this indicates that the excitation of high and low vibrational levels takes place at different heights as a result of the action of different mechanisms. Simultaneously with the emission of hydroxyl, the authors studied the behavior of the atmospheric emission at $(0,1)$ 8645 \AA due to the O_2 molecule. A comparison of the intensities and rotational temperatures of the O_2 and OH emissions shows a clear tendency for the intensity of one of them to increase as the other increases. Here too, the relation is most clearly expressed for the higher levels. These data indicate that the radiation $(0,1)$ O_2 occurs in the overall process together with the hydroxyl emission. Seasonal variations in the intensity and rotational temperature for the $(4,1)$ OH band are also considered. The temperature was found to reach maximum values (on the order of 240 K) during the winter months and mini-

Card 2/4

ACCESSION NR: AT4034378

imum values (about 160 K) during the summer months. The mean seasonal variations of intensity are less clearly expressed. Orig. art. has: 7 figures.

ASSOCIATION: Mezhdudedomstvennyy geofizicheskiy komitet AN SSSR (Interdepartmental Geophysical Committee, AN SSSR)

SUBMITTED: 00

DATE ACQ: 13May64

ENCL: 01

SUB CODE: ES

NO REF SOV: 008

OTHER: 003

Card 3/4

L 34471-66

ACC NR: AP6026243

SOURCE CODE: CZ/0024/65/000/007/0182/0183

AUTHOR: Berg, Miroslav (Engineer)

ORG: Institute of Geodesy and Cartography, Opava (Ustav geodezie a kartografie)

TITLE: Influence of a change of the measuring mark horizon on the model coordinates and the graphic adjustment

SOURCE: Geodeticky a kartograficky obzor, no. 7, 1965, 182-183

TOPIC TAGS: photogrammetry, mapping, topography

ABSTRACT: The article develops a method of taking into consideration change in the measuring mark horizon in photogrammetric evaluation of technical and economic maps, an effect neglected in topographic mapping. Precautions to be observed in making the measurements are pointed out. This paper was presented by Engineer Jaroslav Zoula, GTU, Prague. Orig. art. has: 1 figure, 10 formulas and 2 tables. [JPRS: 32,859]

SUB CODE: 08 / SUBM DATE: none

Cord 1/1

UDC: 528.722.8

09/6

1792

BEL'YUKOV, V.I. Prinimali uchastiye: BERG, M.D.; KULIKOVA, M.M.

Effect of vibration and muscular tension on the heart.

Eksp. issl. pofiziol., biokhim. i farm. no.3:141-149

'61

(MIRA 16:12)

1. Permskiy meditsinskiy institut.

BERG, N.P.

SOV/180-59-4-47/48

AUTHOR: None given

TITLE: A Conference on the Accuracy of Machine Building Castings

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 4, pp 255-256 (USSR)

ABSTRACT: A conference on the above subject took place in the Institute of Machine Building of the Academy of Sciences of the USSR on 22-24th April 1959. About 200 representatives of scientific-research institutes, laboratories, universities and largest works from 34 towns participated in the conference. The following papers were read: B.B.G'ulyayev "The present state of studies of the accuracy of castings"; P.N.Aksenov "Tasks of investigations of the dependence of the accuracy of castings on technological factors"; N.P.Berg "Methods of analytical evaluation of dimensions of castings"; Yu.A.Vorob'yev "Theoretical and experimental investigations of the accuracy of castings"; I.P.Yegorenkov - "The system of allowances for mechanical working of castings"; Ye.G.Kopanevich "Methods for the determination of tolerances for dimensions of cast parts"; S.A.Kazenkov "Tolerances for non-ferrous castings produced by various

Card 1/3

A Conference on the Accuracy of Machine Building Castings SOV/180-59-4-47/48

methods of casting"; G.N.Nikol'skiy "Methods of controlling the cleanliness of the surfaces of castings"; L.S.Konstantinov "The influence of stresses formed during casting on the accuracy of castings"; L.Ye.Komarov "The process of packing moulds as a factor determining the accuracy of castings"; S.S.Zhukovskiy and Yu. Ch'uan-chin "Sources of errors in the dimensions of castings caused by specific features of operation of the pattern-mould boxes equipment"; A.M.Dubrovskiy "Typical deformations of casting moulds"; V.O.Yakovlev "Conditions of making accurate castings in sand moulds"; M.P.Ivanov "The influence of the chemical composition of iron on the accuracy of dimensions of castings"; S.N.Fomchenko and B.B. Gulyayev "Improvement in the accuracy of castings made in pressed shell moulds"; V.V.Ryzhenkov "Experience in increasing the cleanliness and accuracy of large castings"; N.N.Rubtsov and I.L.Zhelikov "On the accuracy of castings made by the lost wax method"; I.I. Goryunov "An investigation of the accuracy and surface cleanliness of castings made under pressure and by the lost wax method"; M.F.Makel'skiy and

Card 2/3

A Conference on the Accuracy of Machine Building Castings SOV/180-59-4-47/48

B.B.Gulyayev "The formation of the contour of castings during casting under pressure"; K.G.Kovvi, A.A.Dodonov and N.N.Belousov "An improvement in the surface quality of castings made under pressure by forming a vacuum the pressure moulds". It was established that studies on the subject of the accuracy of castings are developing too slowly mainly due to lack of coordination in the research work and insufficient numbers of specialists in the field of mathematics, physics and electronics. In order to develop methods for overall calculations of the accuracy, productivity and economics of casting processes the conference recommended organizing in Moscow, Leningrad and Kiyev (at scientific research institutes and universities) mixed teams consisting of foundry specialists, mathematicians, physicists and economists. ✓

Card 3/3

BERG, O.Ya., inzhener

"Cracks in reinforced concrete and designing of bridges with
thrustless type spans." K.K.Iakobson. Reviewed by O.Ia.Berg.
Tekh.zhel.dor.7 no.7:31-32 J1'48. (MIRA 8:11)
(Reinforced concrete) (Bridges, Concrete) (Yakobson, K.K.)

BERG, O.Ya., kandidat tekhnicheskikh nauk

On the limited state around fissures in reinforced concrete bridge
structures. Trudy TSNIS no.3:5-59 '51. (MLRA 8:11)
(Bridges, Concrete)

BERG, O.Ya., kandidat tekhnicheskikh nauk.

Use of reinforced concrete railroad ties in the people's democracies. Bet.1 shel.-bet. no.9:324-331 D '55. (MLRA 9:3)
(Europe, Eastern--Railroads--Ties, Concrete)

Translation from: Referativnyy zhurnal. Mekhanika. 1957, Nr 7, p 143 (USSR) SOV/i24-57-7-8401

AUTHOR: Berg, O. Ya.

TITLE: An Investigation of the Strength of Reinforced-concrete Structures Subjected to a Large Number of Repeated Loadings (Issledovaniye prochnosti zhelezobetonnykh konstruktsiy pri vozdeystvii na nikh mnogokratno-povtornoy nagruzki)

PERIODICAL: Tr. Vses. n.-i. in-ta transp. str-va, 1956, Nr 19, pp 6-109

ABSTRACT: With respect to the general theory of the strength of concrete an analysis is made of various test-result data obtained from the literature and of data yielded by the author's own experiments. The author concludes that the failure of concrete, except in the case of body stresses produced by high external pressures, always indicates that the concrete's tensile rupture strength has been overcome, and it is the author's contention that this overcoming of the tensile rupture strength occurs well in advance of the total failure and is always evidenced by the appearance of microfissures. Attainment by the concrete's lateral unit deformation of the value 0.5 the author regards as an indication that the concrete's tensile rupture strength has been

Card 1/2

An Investigation of the Strength of Reinforced-concrete Structures Subjected (cont) SOV/124-57-7-8401

finally overcome. The higher total strength exhibited by concrete in which the stress distribution is nonuniform is attributed to the fact that the less-stressed portions thereof must tend to resist the spread of the microfissures. Based upon these general premises, the assumption is made that the measure of a concrete's capacity to withstand a large number of repeated loads should be roughly equivalent to its tensile rupture strength (as the term has been used here) measured in terms of a static load. A description is given of tests made of reinforced-concrete beams and compression-bent columns, wherein the beams and columns were subjected both to static loads and to repeated variable loads with asymmetric cycles having a $\sigma_{\min}/\sigma_{\max}$ characteristic of the order of $0.1 \div 0.2$. In the author's opinion, the test results confirm the validity of the above-stated conclusion with respect to the relationship between failure and rupture strength. Hence, for the purpose of calculating the maximum bending moment allowable with respect to fatigue endurance the author proposes to introduce in place of the concrete's compression strength a term for its capacity to resist formation of microfissures (i.e., its rupture strength) under the assumption that the nominal value of its elasticity modulus be reduced by a factor of 3-5. The endurance range of the concrete in the zone of compressive stresses is found to be broader than is indicated in the 1948 edition of Tekhnicheskiye usloviya proyektirovaniya zheleznodorozhnykh mostov (Technical Specifications for Railroad-bridge Design). Bibliography: 79 references.

V. A. Gastev

KHLEBNIKOV, Ye.L. professor; ANDREYEV, O.V., kandidat tekhnicheskikh nauk; BEGAM, L.G., kandidat tekhnicheskikh nauk; BEGG, O.Ye. kandidat tekhnicheskikh nauk; GAMAYUNOV, A.I., kandidat tekhnicheskikh nauk; DUCHINSKIY, B.W., kandidat tekhnicheskikh nauk; KAZEY, I.I., kandidat tekhnicheskikh nauk; DESOKHIN, B.F., kandidat tekhnicheskikh nauk; LUGA, A.A., kandidat tekhnicheskikh nauk; LYALIN, N.B., kandidat tekhnicheskikh nauk; MEL'NIKOV, Yu.L., kandidat tekhnicheskikh nauk; POL'YEVKO, V.P., kandidat tekhnicheskikh nauk; PROKOPOVICH, T. G., kandidat tekhnicheskikh nauk; STRELETSKIY, N.N., kandidat tekhnicheskikh nauk; TYULENEV, Ye.A., kandidat tekhnicheskikh nauk; KHROMET, Yu.N., kandidat tekhnicheskikh nauk; SHELESTENKO, I.P., kandidat tekhnicheskikh nauk; SHPIRO, G.S., kandidat tekhnicheskikh nauk; YAROSHENKO, V.A., kandidat tekhnicheskikh nauk; ZELEVICH, P.M., inzhener; CHEGO- DAYEV, N.N.; BOBROVA, Ye.N., tekhnicheskiiy redaktor.

[Technical specifications for designing bridges and pipes for railroads of a normal gauge (TUPM-56). Effective July 1, 1957 by order of Ministry of Means of Communication and the Ministry of Transportation Construction, September 15, 1956] Tekhnicheskie uslovia proektirovaniia mostov i trub na zheleznykh dorogakh normal'noi kolei (TUPM-56). Vvedeny v kachestvo vremennykh s 1 iuliia 1957 g. prikazom Ministerstva putei soobshcheniia i Ministerstva transportnogo stroitel'stva of 15 sentyabrya 1956 g. No.250/TsZ/213. Moskva, Gos.transp.zhel-dor.izd-vo, 1957. 221 p.

(MLRA 10:5)

1. Russia (1923- U.S.S.R.), Ministerstvo putei soobshcheniya.
(Railroad bridges--Design)

SOV/124-58-5-6054 D

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 5, p 150 (USSR)

AUTHOR: Berg, O.Ya.

TITLE: Investigation of the Strength of Reinforced-concrete Structures Under the Action of Repeatedly-applied Loads (Issledovaniye prochnosti zhelezobetonnykh konstruktsiy pri vozdeystvii na nikh mnogokratno povtorno nagruzki)

ABSTRACT: Bibliographic entry on the author's dissertation for the degree of Doctor of Technical Sciences, presented to the Mosk. inzh.-stroit. in-t (Moscow Institute of Structural Engineering), Moscow, 1957

ASSOCIATION: Mosk. inzh.-stroit. in-t (Moscow Institute of Structural Engineering), Moscow

1. Structures--Stability
2. Structures--Stresses
3. Reinforced concrete--Performance

Card 1/1

BERG, O.Ya., kand.tekhn.nauk

Methods of calculating the bearing capacity of reinforced concrete structural components in TUFN -56 [Specifications for Railroad Bridges and Culverts]. Transp.stroi. 7 no.7:18-21 J1 '57.

(MIRA 10:11)
(Reinforced concrete--Tables, calculations, etc.)

GVOZDEV, A.A., prof., doktor tekhn. nauk; MIKHAYLOV, V.V., prof.; DMITRIYEV, S.A., kand. tekhn. nauk, starshiy nauchnyy sotrudnik; KALATUROV, B.A., kand. tekhn. nauk, starshiy nauchnyy sotrudnik; TABENKIN, N.L., inzh.; KOSTYUKOVSKIY, M.G., kand. tekhn. nauk; VASIL'YEV, B.F., inzh.; pri uchastii kand. tekhn. nauk O.Ya. BERG i inzh. I.S. PRIKHOD'KO; TEMKIN, L.Ye., inzh., red.; PETROVA, V.V., red. izd-va; EL'KINA, E.M., tekhn. red.

[Instructions for designing prestressed reinforced concrete structures] Instrukttsiia po proektirovaniu predvaritel'no napriazhennykh zhelezobetonnykh konstrukttsii (SN 10-57); utverzhdena Gosudarstvennym komitetom Soveta Ministrov SSSR po delam stroitel'stva 14 oktiabria 1957 g. Moskva, Gos. izd-vo lit-ry po stroit., arkhitekt. i stroit. materialam, 1958. 239 p. (MIRA 11:5)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po delam stroitel'stva. 2. Laboratoriya teorii zhelezobetona i armatury i laboratoriya predvaritel'no napriazhennykh konstrukttsiy Nauchno-issledovatel'skogo instituta betona i zhelezobetona Akademii stroitel'stva i arkitektury SSSR (for Gvozdev, Mikhaylov, Dmitriyev, Kalaturov). 3. Gosudarstvennyy institut tipovogo proyektirovaniya i tekhnicheskikh issledovaniy Glavstroyproyekta (for Tabenkin, Kostyukovskiy, Vasil'yev). 4. Deystvitel'nyy chlen Akademii stroitel'stva i arkitektury SSSR (for Gvozdev, Mikhaylov)
(Prestressed concrete construction)

BERG, O.Ya., kand.tekhn.nauk; GRIGOR'YEV, D.A., kand.tekhn.nauk

Use of reinforced concrete in bridge construction. Trudy TSNIIS
Trudy TSNIIS no.27:7-77 '58. (MIRA 11:7)
(Bridges, Concrete)

summary

BASHAY, K. I. - "Dimensional tolerances of heavy elements" (Session IV)
 BILYAL, Ye. I. - "Research on conditions of work and ultimate state of steel frames of industrial buildings" (Session II)
 BRY, O. Ya. - "Research on the concrete strength theory" (Session II)
 BOGDANOV (fnu) (probably Nikolay M. Bogdanov) and KHLISOV (fnu) - "General regulations adopted in new 'Instructions on design, erection and maintenance of flat roofs in the USSR' and the result of recent investigation of flat roof structures in the USSR" (Session VI)
 BOKISHCHIK, M. S. - "Resistance of reinforced concrete members to the effect of transverse forces" (Session II)
 GULLEY, A. A., Prof. Dr. - "Present state and problems of design of building structures" (Session II)
 KLEJTSOV, Grigoriy F., Prof. - "Eastern European experience" (Session IV)
 KOROZOV, N. V., and KURDIN, P. V. - "Problems of joining heavy elements in precast dwellings" (Session IV)
 KURASHOV, V. I., Prof. Dr. - "Resistance to cracking and stiffness of reinforced concrete members" (Session II)
 OVSJANKIN, V. I., Prof., President of Session II; also scheduled to present a paper in Session IV, title not given. Member of the Steering Committee for the Congress.
 PERANITSIN, Aleksey N., Prof. Dr. - "Design of carrying capacity of slabs and shells by the limit balance method" (Session II)
 REAGIN, F. F., GASTEV, G. A., Prof. Dr., and PETLIN, D. A. - "Stability of multi-story buildings of heavy elements" (Session IV)

reports to be submitted for the 2nd. Congress and Third General Assembly,
 Int. Council for Building Research, Studies and Documentation, Rotterdam,
 Netherlands, 21-25 Sep 1959.

ZOLOTARSKIY, Aleksey Fedorovich, kand.tekhn.nauk; SEREBRENNIKOV, Vladimir Vasil'yevich, kand.tekhn.nauk; BERG, Oleg Yanovich, kand.tekhn.nauk; SHESTOPEROV, Sergey Vladimirovich, prof., doktor tekhn.nauk; VERIGO, Mikhail Feliksovich, prof., doktor tekhn.nauk; SOROKIN, N.N., red.; VERINA, G.P., tekhn.red.

[Reinforced concrete ties] Zhелеzobetonnye shpaly. Pod red. M.F.Verigo. Moskva, Gos.transp.zhel-dor.izd-vo, 1959. 327 p.
(Railroads--Ties, Concrete) (MIRA 12:3)

BERG, O.Ya. doktor tekhn.nauk

Strength of concrete and other materials with various resistance
characteristics under combined tensile and compressive stress.

Trudy TSNIIS no.36:5-41 '60.

(MIRA 13:9)

(Concrete)

(Strains and stresses)

BERG, O.Ya., doktor tekhn.nauk

Endurance of reinforced concrete construction elements. Trudy
TSNIIS no.36:151-167 '60. (MIRA 13:9)
(Reinforced concrete--Testing)

BERG, O.Ya., doktor tekhn. nauk, prof.: BEGAK, B.A., red. izd-va; ABRA-
MOVA, V.M., tekhn. red.

[Physical bases of the theory of the strength of concrete and
reinforced concrete] Fizicheskie osnovy teorii prochnosti beto-
na i zhelezobetona. Moskva, Gos. izd-vo lit-ry po stroit.,
arkhit. i stroit. materialam, 1961. 96 p. (MIRA 14:11)
(Concrete)

BERG, O.Ya., doktor tekhn. nauk, prof.; PISANKO, G.N., kand. tekhn. nauk;
KHROMETS, Yu.N., kand. tekhn. nauk; SHCHERBAKOV, Ye.N., inzh.

Stressed state of concrete in the area of the distribution of
prestressed reinforcement. Transp. stroi. 14 no.11:49-52 N '64.
(MIRA 18:3)

ACC NR: AP5025442 ^{44.5} SOURCE CODE: UR/009/05/000/009/0034/0030

AUTHORS: Berg, O. Ya. (Doctor of technical sciences, Professor); Hagevich, Yu. M. (Engineer) ⁴⁸

ORG: none ^B

TITLE: Some peculiarities of the destruction process of glass-plastic reinforcement

SOURCE: Beton i zhelezobeton, no. 9, 1965, 34-36 ¹⁵

TOPIC TAGS: construction material, glass fiber, material strength, ultrasonic device/ PIK 7 ultrasonic device ¹⁰

ABSTRACT: Ultrasonic vibration soundings were used in the process of testing glass-reinforced plastics to determine characteristics of progressive failure stages of these materials and the relationship of the failure process to the ultimate strength of the glass-reinforced plastic. Observations of the strength variation in rods 11 and 22 mm in diameter, loaded for a period of up to one year, showed that the ultimate strength is characterized by stresses which are 62.5 and 65% respectively of the strength found in short term tests (see Fig. 1). The ultrasonic testing featured an impulse ultrasonic device PIK-7. This device allows the determination of the time of propagation of vibrations in a glass-reinforced plastic rod. Results of longitudinal deformation measurements verified an earlier conclusion that up to

Card 1/3 UDC: 677.521.691.32

ACC NR: AP5025142

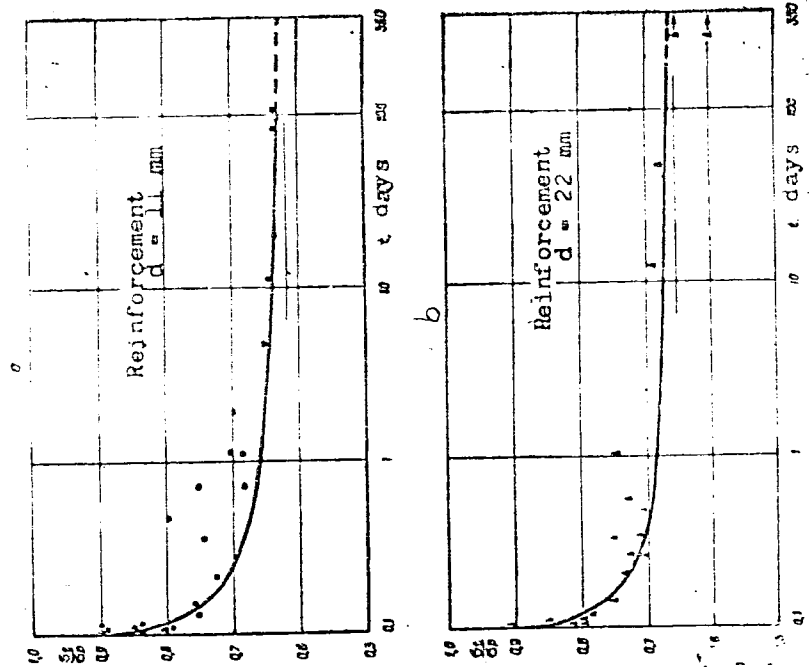


Fig. 1. Curves of the failure of glass-plastic reinforcement under prolonged loading: a- 11-mm diameter bar; b- 22-mm diameter bar

Card 2/3

L 8125-66

ACC NR: AP5025442

the moment of failure a linear stress and strain relationship persists. Curves of the variation of the time of propagation of ultrasonic waves along the test rods are presented and discussed. Changes in the structure of the material under loading are accompanied by a deviation from a nominal value of the propagation velocity of the ultrasonic impulse. Several possibilities are advanced to explain this phenomenon in terms of changes in the fabric of the glass plastic. The authors recommend that this testing method be used to load-test different glass-reinforced plastic materials formed with various fillers and binders and made by diverse methods. Orig. art. has: 2 figures.

SUB CODE: MT/

SUBM DATE: none/

ORIG REF: 002

Card 3/3

L 47452-66 EWT(d)/EWT(m)/EWP(v)/EWP(k)/EWP(h)/EWP(l)
 ACC NR: AP6008918 (A) SOURCE CODE: UR/0097/65/000/011/0037/0039

AUTHORS: Berg, O. Ya. (Doctor of technical sciences, Professor); Smirnov, N. V. (Engineer)

ORG: none

TITLE: On the strength of concrete in biaxial compression

SOURCE: Beton i zhelezobeton, no. 11, 1965, 37-39

TOPIC TAGS: concrete, material test, biaxial compression, material strength, compressive strength

ABSTRACT: Experimental tests were performed at the All-Union Scientific Research Institute of Transport Construction (Vsesoyuznyy nauchno-issledovatel'skiy institut transportnogo stroitel'stva) to measure the strength and deformation of concrete under biaxial compression ($\sigma_1 \geq \sigma_2$, $\sigma_3 = 0$). The device used for the testing

consisted of a 200-ton vertical press with a horizontal arm having a 200-ton capacity screw jack. The tests were conducted with various stress ratios ranging from $\sigma_2/\sigma_1 = 0$ (uniaxial compression) to $\sigma_2/\sigma_1 = 1$. Concrete specimens of dimensions

40 x 40 x 9.6 cm were prepared in metallic forms with vibration treatment. The grade of concrete was varied between the limits of 360—600 kg/cm². The specimens

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ACC NR: AP6008918

0

were stored after a 4-day preliminary set and held at a temperature of 14--18C under a water spray for a 28-day period. A scheme for providing step increases in stress for the test specimens is discussed. During the tests measurements were made of the longitudinal deformations along the principal stress directions, and also of transverse deformations in the unloaded direction. The test results were contrasted with the hypothesis that the increase of strength observed in individual tests was due to the force of friction at the edge of the specimen. The stress distribution from normal and tangential edge forces on an element of a test specimen is plotted. Ultrasonic stress measurements were employed in the tests, and the measurements are tabulated. Data plots of transverse deformations are shown, as is a plot of the measured variation of the coefficient of transverse deformation for uniaxial and biaxial compression. Orig. art. has: 6 figures and 2 tables.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 004/ OTH REF: 001

Card

2/2 *egh*

BERG, O.Ya., doktor tekhn. nauk; SMIRNOV, N.V., inzh.

Evaluation of the strength of structural elements in plane
stress. Transp. stroi. 15 no.9:46-48 S '65.

(MIRA 18:11)

BERG, O.Yá., doktor tekhn.nauk, prof.; PISANKO, G.N., kand.tekhn.nauk;
SMOL'YANINOV, A.A., kand.tekhn.nauk; SHCHERBAKOV, Ye.N., inzh.

Causes of the formation of longitudinal cracks in centrifuged
supports of overhead contact systems. Transp.stroi. 15 no.10:42-
46 0 '65. (MIRA 18:12) .

BERG, P.A.; ORLOV, A.M.; MINOR, A.K.

Improved methods for transporting bricks piled "treelike" on
extended trays. Suggested by P.A.Berg, A.M.Orlov, A.K.
Minor. Rats.i izobr.Predl.v stroi. no.12:48-51 '59.
(MIRA 13:5)

1. Po materialam tresta Tagilstroy Sverdlovskogo sovnarkhoza,
Nizhniy-Tagil, Sverdlovskoy oblasti.
(Bricks--Transportation)

BERG, P.D.; GOL'DSHTEYN, R.I.; ZEL'KIND, Ye.M.; TOMASHPOL'SKIY, L.M.;
FEDOROV, I.V.; IVANOV, V.A.; CHEKULAYEVA, Yu.I.; KURCVA, E.A.,
red.; NIKOLAYEVA, Ye.A., ved. red.; MASOLOV, Ya.M., tekhn. red.

[Petroleum refining in capitalist countries; statistical studies]
Neftepererabatyvaiushchaia promyshlennost' kapitalisticheskikh
stran; statisticheskii sbornik. Moskva, Vol.1. [Petroleum
refining and petroleum products] Pererabotka nefi i proizvodstvo
nefteproduktov. 1960. 219 p. Vol.2. [Consumption, transportation,
and storage of petroleum and petroleum products] Potreblenie,
transport i khranenie nefi i nefteproduktov. 1961. 323 p.
(MIRA 15:6)

1. Moscow. Gosudarstvennyy nauchno-issledovatel'skiy institut na-
uchnoy i tekhnicheskoy informatsii.
(Petroleum--Refining) (Petroleum industry--Statistics)

GULYAYEV, Boris Borisovich. Prinimali uchastiye: SHAPRANOV, I.A., kand.tekhn. nauk; MAGNITSKIY, O.N., kand.tekhn.nauk; POSTNOV, L.M., kand.tekhn. nauk; BOROVSKIY, Yu.F., kand.tekhn.nauk; KOLACHEVA, O.V., kand. tekhn.nauk. BERG, P.O., prof., doktor tekhn.nauk, zasluzhennyy deyatel' nauki i tekhniki, retsenzent; PROZHOGIN, A.A., nauchnyy red.; CHPAS, M.A., red.izd-va; KONTOROVICH, A.I., tekhn.red.; SPERANSKAYA, O.V., tekhn.red.

[Founding processes] Liteinye protsessy. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1960. 415 p.

(MIRA 13:?)

(Founding)

1ST AND 2ND ORDERS		PROCESSES AND PROPERTIES INDEX	
<p>Desulfurization of cast iron during melting in the cupola. R. P. Berg and N. G. Girshevich. <i>Litmetne</i> (1940, No. 1-2, 10-11). Ordinary compn. and the concn. of S in metal and slag during melting in the cupola are such that there is no migration of S from the slag to the cast Fe. Desulfurization of the cast Fe with soda takes place by the formation of Na_2S and the soln. of FeS and MnS in soda slag. The desulfurizing action of soda is greater the greater the ratio of Na_2O to SiO_2 and it is significant even with a 2nd treatment of the metal with the soda slags. Reuse of the slags a 3rd time is suggested.</p> <p>B. Z. Kamich</p>		<p>9</p>	
<p>ASB. S. A. METALLURGICAL LITERATURE CLASSIFICATION</p>			
<p>1940000 04</p>		<p>1940000 04</p>	

1ST AND 2ND ORDERS		PROCESSING AND PROPERTIES INDEX		3RD AND 4TH ORDERS	
C4		<p>A review of the technology of founding in Germany during the war years. P. P. Berg. <i>Vestnik Mashinostroyeniya</i> 26, No. 1, 64-62(1940). The review is compiled on the basis of German tech. literature and an inspection of foundries in Silesia, Saxony, and Thuringia. The review comprises molding materials their testing, prep., and molds; cupola construction and operation; and metals, their comp., and properties. 48 references. M. Hosh.</p>		8	
ASB-51A METALLURGICAL LITERATURE CLASSIFICATION					
3RD AND 4TH ORDERS					
1ST AND 2ND ORDERS					

CA

31

Luminescence analysis of molding materials. P. P. Berg, A. M. Lys, and I. A. Vilenkaya. *Tekhn. Mashino-*
stroeniya 27, No. 9, 59-64 (1947); *Chem. Zentr.* 1949, 702-

3. Luminescence analysis is useful for the detn. of the type of binding agent, the degree of homogeneity, the properties of the molding mixt., and the degree of dryness. In certain cases such analysis can be used for the quant. detn. of the compn. of the mold material and for the detection of changes therein which cannot be detected by other means. The luminescence of the following constituents of the molding mass under various conditions was studied: linseed oil, sunflower-seed oil, sulfite liquor, dextrin, colophony, various kinds of tar, benzine, kerosine, mineral oils, and paraffin.

M. G. Mowat

A18-E. Application of a Cupola With Several Rows of Tuyeres. (In Russian.) P. I. Berg and L. I. Serebrier. Vestnik Mashinostroeniya (Bulletin of the Machine Construction Industry), v. 30, Mar. 1960, p. 27-29.

Operation of cupola was experimentally investigated. Effects of various factors. Theoretical advantages of multiple-tuyera system. (E10, C1)

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ALPHABETIC INDEX																										NUMERIC INDEX																										SYMBOLIC INDEX																																																																													
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100			
<p>Processes and Properties Index</p> <p>Eutectic cast iron. P. P. Berg. <i>Repts. Central Inst. Metals (Leningrad)</i> No. 10, 141 (in German 1949 (1949)). - On the basis of analysis of 50 samples of cast iron, an empirical formula has been worked out for the C content of eutectoid iron, as follows: $C = 4.3 - 0.3(Si + P - Cr)$, where the C, Si, P and Cr stand for percentages of these elements in the iron. S. I. Alshovskiy</p>																																																																																																																																	
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